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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,588	08/29/2003	Ryuji Mori	81716.0110	9148

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EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/652,588	MORI ET AL.	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 10-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed July 14, 2005 has been fully considered and entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-6, 10, 12, 13, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashikawa (US 6,318,910 B1).

Regarding claim 1; Higashikawa discloses an optical element housing package (see Figure 4), comprising:

- a base body (5, case) having a placement portion formed on one surface thereof, on which an optical element (4, semiconductor laser) is placed; and
- a frame body (10, airtight joint) attached to the one surface of the base body so as to surround the placement portion, the frame body having an optical fiber introducing portion (6, fiber introducing section) formed in one end part of its side surface, the optical fiber introducing portion being shaped as a groove having a substantially U-shaped sectional profile, through which and optical fiber (7) is inserted and brazed (see

column 5, lines 54-56 and column 7, lines 28-32), wherein a lid body (8, cover) is brazed (see column 6, lines 60-64) to one surface of the frame body (10).

Higashikawa does not explicitly state that the optical fiber introducing portion has an opening having width in a range from r + 5 μm to r + 200 μm, and a depth in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber. It is clear from Figure 4 of Higashikawa that the optical fiber introducing portion is larger than, but proportional to the size of the optical fiber in order to accurately locate and secure the optical fiber. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the width of the optical fiber introducing portion (6) be in a range from r + 5 μm to r + 200 μm, and the depth of the optical fiber introducing portion be in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber, in order to accurately position and secure the optical fiber and ensure that the optical fiber fits into the optical fiber introducing portion, since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claim 3; the package further comprises input/output terminal conductors that are led from the placement portion to another surface opposed to the one surface of the base body (see Figure 4, the input/output terminal conductors located on the opposing surface are not labeled).

Regarding claim 4; the optical element (4) is a laser that couples light having a wavelength to the optical fiber (7).

Regarding claims 5 and 6; Higashikawa discloses all of the limitations of these claims as applied above, except for specifically stating that the input/output terminal conductor allows input and output of a high-frequency signal of 10 GHz or above. One of ordinary skill in the art would have found it obvious to have the input/output terminal conductor allow input and output of a high-frequency signal of 10 GHz or above in order to operate a laser requiring a high-frequency signal, since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claims 10 and 12; Higashikawa discloses all of the limitations of these claims as applied above, except for a thickness of the frame body being in a range from 0.7 mm to 1.8 mm. It is clear from Figure 4 of Higashikawa that thickness of the frame body is sized to allow the semiconductor laser (4) and silicon substrate (1) supporting the laser to fit within the package, while minimizing the space inside the package to ensure that the optical package is compact. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a thickness of the frame body be in a range from 0.7 mm to 1.8 mm., in order to allow a semiconductor laser (4) and silicon substrate (1) supporting the laser to fit within the package, while minimizing the space inside the package to ensure that the optical package is compact,

since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claims 13 and 15; Higashikawa discloses all of the limitations of claims 13 and 15 as applied above, except for the part of the optical fiber located in the optical fiber introducing portion being exposed, and the bared core having its outer circumference coated with a plating film. Higashikawa teaches that the optical fiber, including the coating, is fixed with a solder having a low melting point. A known alternative for fixing optical fibers to optical modules includes removing a coating from the fiber and coating the bared core with a metallic plating film for soldering. Therefore, one of ordinary skill in the art would have found it obvious to fix the optical fibers to the optical module by removing a coating from the fiber to be fixed and coating the bared core with a plating film, since this is a well known alternative method.

Regarding claim 22; Figure 4 of Higashikawa discloses an optical module comprising:

- the optical element housing of claim 1;
- an optical element (4) placed on the placement portion;
- an optical fiber (7) inserted through the optical fiber introducing portion and subjected to brazing; and

- a lid body (8) brazed to the one surface of the frame body, for hermetically sealing the optical element and the optical fiber introducing portion (6).

Claims 1, 2, 13, 14, 16, 17, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velsher et al. (US 6,796,725 B2).

Regarding claim 1; Velsher et al. discloses an optical element housing package (see Figures 1-4), comprising:

- a base body having a placement portion (34) formed on one surface thereof, on which an optical element (50) is placed; and
- a frame body (14) attached to the one surface of the base body so as to surround the placement portion, the frame body having an optical fiber introducing portion (54) formed in one end part (24, 26) of its side surface, the optical fiber introducing portion being shaped as a groove having a substantially U-shaped sectional profile, through which and optical fiber (22) is inserted and brazed (see column 2, lines 64-67), wherein a lid body (16) is brazed (see column 2, lines 60-64) to one surface of the frame body (14).

Velsher et al. does not explicitly state that the optical fiber introducing portion has an opening having width in a range from r + 5 μm to r + 200 μm, and a depth in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber. It is clear from Figure 6 and column 5, lines 22-28 of Velsher et al. that the optical fiber introducing portion is larger than, but proportional to the size of the optical fiber in order to

accurately locate and secure the optical fiber. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the width of the optical fiber introducing portion (6) be in a range from r + 5 μm to r + 200 μm, and the depth of the optical fiber introducing portion be in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber, in order to accurately position and secure the optical fiber and ensure that the optical fiber fits into the optical fiber introducing portion, since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claim 2; Figures 1-4 disclose an input/output terminal (18) fitted in an input/output terminal fitting portion shaped as a through hole or a notch, the input/output terminal fitting portion being formed on the side of the frame body (14) or in that part of the base body which is located inside the frame body.

Regarding claims 13 and 14; Velsher et al. discloses that the part of the optical fiber located in the optical fiber introducing portion may be exposed and the bared core coated with a plating film (see column 2, lines 64-67).

Regarding claims 16 and 17; the frame body (14) has an optical fiber supporting member (36, 38) bonded to the base body side surface thereof so as to be located below the optical fiber introducing portion.

Regarding claims 19 and 20; the lid body (16) includes a flange portion (46, 48) that is bonded to the top surface of the optical fiber supporting member (36, 38).

Regarding claim 22; Figures 1-4 of Velsher et al. disclose an optical module (10) comprising:

- the optical element housing of claim 1;
- an optical element (50) placed on the placement portion (34);
- an optical fiber (22) inserted through the optical fiber introducing portion (54) and subjected to brazing; and
- a lid body (16) brazed to the one surface of the frame body, for hermetically sealing the optical element and the optical fiber introducing portion.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Velsher et al. (US 6,796,725 B2).

Regarding claim 11; Velsher et al. suggests all of the limitations of claim 11 as applied above, except for a thickness of the frame body being in a range from 0.7 mm to 1.8 mm. It is clear from Figures 5 and 6 of Velsher et al. that thickness of the frame body is sized to allow the optical element (50) and the substrate supporting the optical element to fit within the package, while minimizing the space inside the package to ensure that the optical package is compact. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a thickness of the frame body be in a range from 0.7 mm to 1.8 mm., in order to allow an optical element and substrate supporting the optical element to fit within the package, while minimizing

the space inside the package to ensure that the optical package is compact, since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashikawa (US 6,318,910 B1) in view of Velsher et al. (US 6,796,725 B2).

Regarding claims 18 and 21; Higashikawa suggests all of the limitations of these claims as applied above, except for the frame body having an optical fiber supporting member bonded to the base body side surface thereof so as to be located below the optical fiber introducing portion and for the lid body including a flange portion that is bonded to the top surface of the optical fiber supporting member.

Velsher et al. teaches that an optical fiber supporting member (36, 38) may be bonded to a base body side surface of a frame body (14) in an optical module so as to be located below an optical fiber introducing portion and that a flange portion (46, 48) may be included on a lid body (16) of the optical module and bonded to the top surface of the optical fiber supporting member in order to form end pipes (56, 58) that provide additional support, stress relief and protection for optical fibers connected to the optical module.

Therefore, one of ordinary skill in the art would have found it obvious to incorporate an optical fiber supporting member bonded to the base body side surface of

the frame body so as to be located below the optical fiber introducing portion and a flange portion on the lid body that is bonded to the top surface of the optical fiber supporting member in the invention of Higashikawa in order to provide additional support, stress relief and protection for optical fibers connected to the optical module/package disclosed by Higashikawa.

Response to Arguments

Applicant's arguments filed July 14, 2005 have been fully considered but they are not persuasive.

Regarding rejections to the claims over Higashikawa (US 6,318,910) and Velsher et al. (US 6,796,725); Applicant states that claim 1, as amended, incorporates the limitation of canceled claim 7, and that both Higashikawa and Velsher et al. fail to teach or suggest that feature. Applicant further states that in Higashikawa, hermetical sealing in an optical fiber introducing section is realized by using a solder in combination with a resin such as silicone and that in the present invention, the width and depth of an opening of the optical fiber introducing portion are specified to be in a constant range, which makes in possible to completely eliminate the occurrence of a void in a brazing filler material and to protect the optical fiber against breakage effectively, whereby hermetical sealing of an optical fiber introducing portion is achieved favorably.

It is agreed that Higashikawa and Velsher et al. do not explicitly state that the optical fiber introducing portion has an opening having a width in a range from r + 5 μm to r + 200 μm, and a depth in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber. However, it is clear from both references that the optical

fiber introducing portion is larger than, but proportional to the size of the optical fiber in order to accurately locate and secure the optical fiber. And, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the width of the optical fiber introducing portion (6) be in a range from r + 5 μm to r + 200 μm, and the depth of the optical fiber introducing portion be in a range form r + 5 μm to r + 200 μm, in which r is a diameter of the optical fiber, in order to accurately position and secure the optical fiber and ensure that the optical fiber fits into the optical fiber introducing portion, since it has been held that wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Both Higashikawa and Velsher et al. teach an optical fiber introducing portion being shaped as a groove having a substantially U-shaped sectional profile, through which and optical fiber is inserted and brazed, wherein a lid body is brazed to one surface of the frame body and a hermetic seal is achieved (see the abstracts of both references).

The claims of the present application do not require the occurrence of a void in a brazing filler material to be completely eliminated. Furthermore, it is known in the art that substantially U-shaped grooves substantially eliminate void formation in fiber fixing grooves where solder is employed (For example: see column 17, lines 13-19 of US 6,195,495 B1).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa
Patent Examiner
October 4, 2005